

CLAIMS

1. A fluid controller comprising: a block-like main body having a fluid inflow passage, a fluid outflow passage and a concave portion open upward; and a diaphragm pressed against
5 or moved apart from an annular valve seat arranged within the concave portion of the main body so as to open and close the fluid passages, wherein

the concave portion is formed into a shape including a large-diameter portion close to the opening and a small-diameter
10 portion connected to a lower side of the large-diameter portion via a step portion, and the fluid controller is further provided with a flow path forming disk fitted to the concave portion,

the flow path forming disk includes a large-diameter cylinder portion fitted to the large-diameter portion of the
15 concave portion in a fluid tight manner, a small-diameter cylinder portion having an outer diameter smaller than an inner diameter of the small-diameter portion of the concave portion and having a lower end received by a bottom surface of the concave portion, and a coupling portion coupling a lower end portion
20 of the large-diameter cylinder portion and an upper end portion of the small-diameter cylinder portion and received by the step portion of the concave portion, and

a peripheral edge portion of the diaphragm is fixed to an upper end portion of the large-diameter cylinder portion of
25 the flow path forming disk, a valve seat is provided in the upper

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end portion of the small-diameter cylinder portion of the flow
path forming disk, an inner annular space of the large-diameter
cylinder portion is formed by an inner periphery of the
large-diameter cylinder portion of the flow path forming disk,
5 the diaphragm, the valve seat and a top surface of the coupling
portion of the flow path forming disk, a plurality of through
holes communicating an outer annular space of the small-diameter
cylinder portion formed between the small-diameter cylinder
portion of the flow path forming disk and a peripheral surface
10 of the small-diameter portion of the concave portion with an
inner annular space of the large-diameter cylinder portion are
formed in a coupling portion of the flow path forming disk, any
one of the fluid inflow passage and the fluid outflow passage
is communicated with a lower end of the small-diameter cylinder
15 portion of the flow path forming disk, and the other is formed
so as to be communicated with the outer annular space of the
small-diameter cylinder portion.

2. The fluid controller of claim 1, wherein the passage
communicating with the lower end of the small-diameter cylinder
20 portion of the flow path forming disk includes a short passage
extending directly below from the lower end of the small-diameter
cylinder portion, and a long passage extending to an outer side
from a lower end of the short passage so as to form an acute
angle, and the passage communicating with the outer annular space
25 of the small-diameter cylinder portion extends obliquely to a

lower outer side from the outer annular space of the small-diameter cylinder portion.

3. The fluid controller of claim 2, wherein a joint portion having an inclined passage communicating with the long passage is provided in one side surface of the main body in a protruding manner, and a joint portion having an inclined passage communicating with the passage communicating with the outer annular space of the small-diameter cylinder portion is provided in the other side surface of the main body in a protruding manner.

4. The fluid controller of any one of claims 1 to 3, wherein a total cross sectional area of a plurality of through holes in the vertical direction formed in the coupling portion of the flow path forming disk is set to 0.5 to 2.0 times of the cross sectional area of the small-diameter cylinder portion of the flow path forming disk.

5. The fluid controller of claim 1, wherein a seal member is interposed between the lower end surface of the flow path forming disk and the bottom surface of the concave portion of the main body.

6. The fluid controller of claim 5, wherein an annular seal projection brought into close contact with each of upper and lower surfaces of the seal member is formed in the lower end surface of the flow path forming disk and the bottom surface of the concave portion of the main body.